

Also according to a preferred variant of the invention, the viscosity V2 is greater than the viscosity V1 by a factor of at least 5.

5 As regards the preparation of the copolymers used according to the invention, it may be carried out by any conventional polymerization or polycondensation technique. The choice of the method of preparation is generally carried out while taking into account the
10 structure desired for the copolymer, namely a comb, linear or branched structure, and the chemical nature of the various blocks constituting it.

By way of illustration of these variant preparations,
15 there may be mentioned most particularly the processes according to which the said copolymers are obtained by:

- ionic or free-radical polycondensation, polymerization or copolymerization of identical or
20 different monomers, of identical or different macromonomers, or of a mixture of identical or different monomers and macromonomers, or
- 25 by grafting several polymeric segments with LCST onto a linear or branched polymeric skeleton which is essentially of the soluble type, or by polymerization of polymeric side segments with LCST from a linear or branched polymeric skeleton which is essentially of the soluble type.

30 Preferably, all or some of the copolymers used according to the invention are obtained by:

- 35 a) copolymerization of monomers which are essentially of the soluble type and of macromonomers which are essentially of the type with LCST comprising a reactive functional group at least at one of their ends, or

- b) copolymerization of macromonomers which are essentially of the type with LCST comprising a reactive functional group at least at one of their ends, and macromonomers which are essentially of the soluble type comprising at least one reactive functional group in their structure.

For the purposes of the invention, the expression reactive functional group is understood to mean a group allowing the molecule carrying this group to be integrated into the macromolecule during the copolymerization reaction without interrupting the said copolymerization.

Using the preferred methods and rules set out above, persons skilled in the art are capable of preparing copolymers in accordance with the invention by adapting the structure, the nature and the method of preparation of the said polymers according to the separation properties desired for one application or another.

By way of nonlimiting illustration of the claimed separation media mention may be most particularly be made of the following media:

- the media transiting from a viscosity V_1 of between 50 and 1 000 mPa.m⁻¹.s⁻¹ at a temperature T_1 of between 15 and 30°C to a viscosity V_2 which is greater than V_1 by a factor of between 2 and 50 at a temperature T_2 of the order of 40°C or higher and comprising between 5 g/100 ml and 20 g/100 ml of copolymers possessing
- an average molecular mass of between 30 000 and 2 000 000 or a number of atoms along the main skeleton of between 1 000 and 60 000,
- a fraction by mass of segments with LCST of between 2% and 20%, and

- 5 - an average molecular mass of the segments with
 LCST of between 2 000 and 20 000 or an average
 number of atoms along a segment with LCST of
 between 35 and 350;

- 10 - the media transiting from a viscosity V_1 of
 between 100 and 10 000 $\text{mPa}\cdot\text{m}^{-1}\cdot\text{s}^{-1}$ at a temperature
 T_1 of between 15 and 30°C to a viscosity V_2 which
 is greater than V_1 by a factor of between 2 and
 100 at a temperature T_2 higher than 40°C and
 comprising between 1 g/100 ml and 80 g/100 ml of
 copolymers possessing:

- 15 - an average molecular mass of between 500 000 and
 5 000 000 or a number of atoms along the main
 skeleton of between 7 000 and 90 000,

- 20 - a fraction by mass of segments with LCST of
 between 2.5% and 15%, and

- 25 - an average molecular mass of segments with LCST of
 between 4 000 and 30 000 or an average number of
 atoms along a segment with LCST of between 60 and
 600; and

- 30 - the media transiting from a viscosity V_1 of
 between 100 and 10 000 $\text{mPa}\cdot\text{m}^{-1}\cdot\text{s}^{-1}$ at a temperature
 T_1 of between 15 and 30°C to a viscosity V_2 which
 is greater than V_1 by a factor of between 2 and
 100 at a temperature T_2 of the order of 40°C or
 higher and comprising between 0.1 g/100 ml and
 5 g/100 ml of copolymers possessing

- 35 - an average molecular mass greater than 500 000 or
 a number of atoms along the main skeleton greater
 than 7 000,